DOCUMENT RESUME

ED 281 625 PS 016 479

AUTHOR Carpenter, C. J.; And Others
TITLE Adult-Supplied Structure and Children's Activity Levels.
PUB DATE Apr 87
NOTE 13p.; Paper presented at the Biennial Meeting of the Society for Research in Child Development (Baltimore, MD, April 23-26, 1987).
PUB TYPE Reports - Research/Technical (143) -- Speeches/Conference Papers (150)

EDRS PRICE MF01/PC01 Plus Postage.
DESCRIPTORS Classroom Research; *Learning Activities; *Physical Activity Level; *Preschool Children; Preschool Education; *Teacher Behavior; *Teacher Influence
IDENTIFIERS *Activity Structure

ABSTRACT

This study investigated the relationship between preschool children's participation in play activities structured by adults and the level of motor activity children exhibited while in those activities, to test the hypothesis that children's motor activity levels vary according to the level of structure imposed on activities by adults. Subjects were 44 preschool children in three age-segregated classrooms for children 2 to 3, 3 to 4, and 4 to 5 years of age. Using a 10-second interval observation recording code, trained observers recorded each child's activity during the free play period for 15 minutes 1 day a week for 4 weeks. Categories noted were the activity in which the child was involved, the occurrence of teacher feedback to the child, and motor activity in one of four levels: (1) little arm, no leg; (2) some arm, some leg; (3) lots of arm, some leg; and (4) lots of arm, lots of leg. Sex by classroom/age were independent variables in a multiple analysis of variance. Quiet levels of motor activity were associated with activities with the middle and highest amount of teacher directions, instructions, or comments. Active levels of motor movement were found to occur when teacher feedback was lowest. Similar results were found in all three classrooms. It is concluded that results offer modest support for the hypothesis that the amount of contact and supervision from adults may be one underlying factor in the development and maintenance of children's motor activity levels. (RH)

**********
* Reproductions supplied by EDRS are the best that can be made *
* from the original document. *
**********

ED281625

U.S. DEPARTMENT OF EDUCATION
Office of Educational Research and Improvement
EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)
X This document has been reproduced as received from the person or organization originating it.
☐ Minor changes have been made to improve reproduction quality.
• Points of view or opinions stated in this document do not necessarily represent official OERI position or policy.

"PERMISSION TO REPRODUCE THIS MATERIAL HAS BEEN GRANTED BY
Jan Carpenter
TO THE EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)."

# ADULT-SUPPLIED STRUCTURE AND CHILDREN'S ACTIVITY LEVELS

C.J. Carpenter, D.Logman, B. Cahoon, & L.Roots.
U of Illinois, Urbana, Il. 61801

Paper presented at SRCD, Baltimore, MD, April, 1987

Introduction.

One of the most well documented sex difference between males and females is activity level. Males at all ages are more active than females (Maccoby & Jacklin, 1974; Block, 1976), and they exhibit more aggressive behavior, a type of vigorous motor activity. Young boys participate more than girls in activities which are associated with higher activitiy levels such as rough and tumble play, large muscle activities, and block play. (Block, 1982; Fagot, 1984; Roper and Hinde, 1978; Connolly and Smith (1982 ).

Although boys are more active than girls, several studies have found that higher activity levels occur when peers are present. In a study of preschool age children, DiPietro (1981) found that when a small group of same -sex peers were placed in trailor equiped with a boo boo doll and inner-tube, the boys were more aggressive and exhibited more rough and tumble play than did the girls. The peer group also influenced the activity levels shown by the children. Both boys and girls were more active with peers present than when they were alone in the room, a result also found by Eaton and Keats (1982).

Activity level correlates.

Studies that examine the stability and correlates of activity level in preschool and early elementary age children, report a consistent pattern of results. These findings are summarized on Table 1. Activity level is stable from preschool to the early elementary period; thus it has often been viewed as an inherent temperament quality. Children with high activity levels are more assertive and aggressive, less compliant, more engaged in social play with peers, more restless and undercontrolled, and they are less cooperative with peers (Buss, Block & Block, 1980; Battle and Lacey, 1972; Halverson & Waldrop, 1973; 1976). Preschool age active males showed less achievement striving, and less compliance toward adults, while active girls were more persistent with intellectual tasks and exhibited orientation toward achievement striving. (Battle and Lacey, 1972). High preschool activity levels were negatively related to dependency, the WISC Verbal and Performance IQ, and performance on the Children's Embedded Figures Test (CEFT)(Halverson & Waldrop, 1976).

Low Adult-Supplied Structure Participation

Also on Table 1, are findings suprisingly similar to results from a series of studies by Carpenter, Huston and colleagues. The research model used in their conceptual framework specifies that children's exposure to high levels of adult-supplied structure (rules and information provided by adults) influences their behavior and socializes adult norms and values. Exposure to activities in which adult influence is not dominant, encourages peer interactions and behaviors. Adult-structure is a term which describes the amount of direction, instructions and praise given to a child via direct

PS 016479

modeling, or direct instructions by an adult in the activity in which the child is participating (Carpenter & Huston-Stein, 1980; Carpenter, 1983). It is labeled "adult-provided structure" since rules or information about appropriate behavior "structure" the social environment for the child. As several authors have pointed out, both adults and children expect adults to exercise control and exert a socializing influence as part of the normal adult-child interactions (Youniss,1980; Piaget, 1965). Direct feedback or modeling are the media for conveying adult information, rules, or expectations.

In preschool studies, low-adult structured activities were inhabited more by boys than by girls, but they were associated for both boys and girls with non-compliance to adults, peer commands and non-compliance, assertion, (leadership attempts), aggression, and inappropriate behavior, high levels of peer interactions, and physical initiations to obtain toys (Carpenter, 1983; Carpenter & Huston- Stein, 1980; Carpenter, Huston & Holt, 1986).

A longitudinal follow-up study analyzed the correlates of children's low and high adult-structured activity participation at preschool, and at middle-childhood. Correlates similar to those reported in the activity level studies were found. Participation in high or low adult-structured activity was stable across the time periods. Preschool participation predicted childrens' social behaviors at the middle childhood period. Academic outcomes similar to the correlates of high activity level were also found. Low-adult activity participation was associated with poor performance on school achievement test results, the PMA Spatial Abilities Test, and on the Children's Embedded Figures Test (CEFT) (Carpenter, Huston, Atwater & Johnson, 1986).

One suggestion for the similarity in these findings is that the level of adult-supplied structure shapes and maintains activity level as well as the peer dominance interactions, aggressive, inappropriate behavior, and poor spatial abilities and school performance. A stable preference for low-adult structured activities could be one underlying component of the stability of activity level across time periods, and of the correlates of activity level.

Purpose of research.

The purpose of this research was to investigate the hypothesis that motor activity levels are associated with children's participation in high or low adult-structured activities. Children were expected to exhibit less active physical levels in high adult-structured activities, and more active levels in low adult- structured activities. High or low adult-supplied structure has an immediate effect on social behaviors; one might hypothesize a similar immediate effect on motor behavior. The research in this study did not investigate the effects of long-term participation in high or low structure activities on motor level. However, continued participation is expected to simultaneously encourage a preference for a particular motor level, and for high or low structure activities. Once in either type of activity, active or quiet motor behaviors are further developed and practiced. Participation in the activity probably increases the probability that a similar type of activity will be preferred in the future.

Physical motor levels are expected to vary by adult-provided structure level for several reasons. Some reasons are related to the normal adult socialization pressures exerted upon children. Adults expect children to adopt adult social behaviors and values as they attempt to shape and refine the semi-skilled social behavior of the young child. Some of the adult expected behaviors include sitting quietly in public places, waiting one's turn, and obeying classroom rules such as "no running, jumping or yelling in the classroom" (Jackson, 1968). Since teachers enforce rules such as these, spending time around the teacher would serve as a constant reminder to the child of the adult rules. If children became too active, teachers gently remind and reinforce them to be quiet, or place them in another activity where quiet behaviors are more likely. Consequently, less motor activity is likely in the presence of the adult.

Other reasons are less direct: teachers often organize their presence in the classroom in order to model new activities, or to supervise messy ones. Thus, teachers may simply spend less time in activities such as large motor areas, bikes and trikes, or large blocks which do not require this type of supervision. The latter activities are associated with higher levels of motor movement than sitting at a table, for instance. Children who spend a lot of time in activities that encourage motor movement would exhibit higher overall levels of motor activity, regardless of teacher presence.

The hypothesis that teacher presence and attention serves to discourage active levels of motor activity at first glance, may appear to contradict recent findings by Fagot (1984). She found with 24-30 month old children, that teacher attention given to boys but not girls for aggressive behaviors functions as a reinforcer. She also found that children who were more active received more negative teacher feedback and more positive peer feedback than quieter children. Teachers appear to reinforce low activity levels, while peers encourage high levels. Based on the activity structure findings, one probable sequence is that the disruptive, or active behavior is likely to be initiated away from the teacher, but once it occurs, it cues a response from the adult which reinforces its occurrence.

## METHOD

### Subjects.

The subjects were 44 preschool-aged children (23 girls, 21 boys ) from three classrooms of the Human Development & Family Ecology Child Development Laboratory at the University of Illinois-Urbana. The ages by classroom were: classrooms 1, 2-3 years; classroom 2, 3-4 years; and classroom 3, 4-5 years.

### Setting.

All classrooms were identical in construction. The rooms were approximately 8' X 8' with low shelves dividing the room into different activity areas. Each activity contained shelves and either tables and chairs or a rug. These activity areas were used during the Free Play period, when the observations took place. During this period the children chose the activities and individuals with which or whom they wanted to interact. The activity areas of all classrooms were Dramatic Play, Science, Books, Language Arts, Art, Sand Table, Large Motor, and Blocks.

All areas were teacher supervised. The number of children per area was limited to approximately four children. A teacher or an assistant was near or in the area and could interact or supervise, but did not always interact with the children.

Classroom Observations.

Children were individually observed by trained observers over a period of four weeks, for a total of 60 minutes per child. Each observer recorded the behavior of one child for 15 minutes one day per week. The children were randomly assigned to observers. Observations were made at the same time during the Free Play period.

During the 15 minute observation, trained observers recorded in 10 second intervals the following categories of behaviors: the activity in which the child was involved, teacher feedback, and the motor activity of the child. The observers received a code sheet which described definitions of activities, teacher feedback, and motor level categories. These are briefly defined below. Child Activity was defined as the task or set of play materials with which the child was engaged in the preschool classroom. Individual Teacher Feedback was defined as teacher comments, direction, or attention to the target child while in an activity, and included either physical or verbal interaction from the teacher to the child. Examples included comments made to the child about their art work, the fact that they were running, or that they made a nice block building. This category also included teacher answers to child questions. Motor Behavior was defined as the motoric level of the child while in different activities. There were four levels: 1= little arm, no leg; 2= some arm, some leg; 3= lots of arm, some leg; 4= lots of arm, lots of leg. Examples of these are shown in Table 2.

Reliabilities were taken a week prior to the first observation, and observers were trained to 90% agreement on all categories. Observer agreement was calculated for each four minute observations using the following formula: total agreement/total agreement and disagreement for all intervals observed.

## RESULTS

Observations for individual children were summed by activities, per week, for each child. The number of intervals the child spent in an activity, the number of intervals of teacher feedback during each activity, and the number of intervals in each of the four levels of motor movement per activity were summed.

Activity Structure.

The unit of analysis in defining structure level was the activity the child was involved in, and not the child. In the three classrooms, a total of 12 activities occurred.

Each activity was assigned an individual teacher feedback structure score. The amount of teacher supplied structure was operationally defined as the number of intervals in an activity in which there was also the occurrence of teacher individual feedback. This was calculated separately for each classroom on the basis of all observations in the activity of that classroom. Teacher feedback in each activity was calculated as: the total number of

observations where individual feedback occurred divided by the total number of observations in that activity. The purpose of this composite score was to define the typical structure level of the activity, rather than to evaluate individual differences in feedback received.

Effects of structure on child behavior.

Each child was the unit of analysis for examining the effects of structure on child behavior, while the activities were the unit of analysis for estimating the teacher structure index. One score was calculated for each child in the 10 or 11 activities: MOTOR ACTIVITY LEVEL = number of intervals in which motor level 1 (still ) occurred in the activity divided by the number of intervals in which the child was observed in the activity.

During an interval of observation, the child was recorded in an activity, and was rated as exhibiting one of the four levels of motor activity movement. One of the four levels was always recorded, thus a ratio of Level 1, could be calculated by dividing motor level 1 (still:little arm, no leg) by the sum of motor level 2 (some arm, some leg) level 3 (lots of arm, some leg), and level 4 (lots of arm, lots of leg). The three most active levels of motor movement were combined for practical and conceptual reasons. Table 3 illustrates the mean frequency per motor level, in the activities in the classrooms. The number of intervals in levels 3 and 4 in these activities is quite small. The combination of levels 2, 3, and 4 provides a comparable number of occurrances to level 1, and permits a contrast between high and low motor activity. In addition, it is conceptually appropriate to compare level 1 (sitting, or still behavior) with the more active levels, since level 1 motor activity is more often the expected behavior by teachers in preschool classrooms.

Univariate and multivariate analyses of variance were carried out on the child behavior to assess the effects of activity structure on this child behaviors. Sex (2) by Classroom (3) were between subjects independent variables for all analyses. The individual teacher feedback index of adult structure was a repeated measure independent variable in the motor behavior analysis. For this structure index, the 10 activities were collapsed to form 3 ordered levels of the independent variable. For the teacher feedback index of structure, activities were rank ordered by the rate of teacher feedback per activity in each classroom. These activities were classified into 3 levels of structure: low, medium and high.

Motor Activity Level. The hypothesis that motor levels vary by structure level in activities, was supported. Using classroom (3) and sex (2) as between subjects variables, the ratio of intervals of level 1 motor behavior (still) per structure level (low, medium, high) was submitted to an analysis of variance. There was a margionally significant classroom age effect $F(2.33) = 3.0$, $p < .06$. These are presented in Table 4.

The means of the classrooms were: young .48, medium, .30, and old, .27. The children in the younger classrooms were exhibiting more quiet behavior than the children in the older classrooms. There was a significant structure effect, $F(2,66) = 3.4$, $p < .04$. There was more quiet behavior in the medium (mean .42) and high structure levels (mean = .34) than in the low structure level (mean = .29).

## DISCUSSION

In the present study, preschool activities were examined for their level of adult-supplied structure. Quiet (non-active) levels of motor activity were associated with activities with the middle and highest amount of teacher directions, instructions or comments. Active levels of motor movement were found to occur when there was the lowest level of teacher feedback in that activity. Similar results were found in all three classrooms, whose children ranged in age from 2 to 5 years.

While these results are limited in their generalizability, they offer modest support for the hypothesis that the amount of contact and supervision from adults (labeled adult-supplied structure in our model) may be one underlying factor in the development and maintenance of motor activity levels. If so, the model offers insight into the underlying process by which motor levels are maintained, but also the process by which the negative correlates of high preschool activity levels are shaped and maintained in children's routine experiences.

Table 1

PRESCHOOL HIGH ACTIVITY LEVEL

-boys exhibit higher activity levels than girls
- high activity children are:
more assertive and aggressive,
less compliant,
more engaged in social play with peers
more restless and undercontrolled,
less cooperative with peers
less achievement striving by active males
less compliance toward adults,

CORRELATES IN MIDDLE CHILDHOOD

-Stability between preschool and middle childhood activity levels
-negative relationship to:
dependency
WISC Verbal and Performance IQ
Children's Embedded Figures Test (CEFT)

Buss, Block & Block, 1980
Battle and Lacey, 1972
Halverson & Waldrop, 1973; 1976

PRESCHOOL LOW-ADULT STRUCTURED ACTIVITY PARTICIPATION

-boys participate more than girls
-Behaviors associated are:
non-compliance to adults
peer directed commands,
compliance and non-compliance to peers
high peer interaction levels
inappropiate and aggressive behavior
physical initiations to obtain toys
low level of interactions with adults

CORRELATES IN MIDDLE CHILDHOOD

-stable preference for low-structure activities from preschool to middle childhood
-negative relationship to:
school achievement
PMA Spatial Ability score
Children's Embedded Figures Test (CEFT)
-positively related to Harter perceived athletic competence subscale

Carpenter & Huston-Stein, 1980
Carpenter, 1983
Huston & Carpenter, 1985
Carpenter, Huston, Atwater & Johnson, 1986
Huston, Carpenter, Atwater & Johnson, 1986
Carpenter, Huston & Holt, 1986
Carpenter, 1987

Table 2

Motor Activity Levels

| Level | Motor Behavior | Activity Example |
|---|---|---|
| 1. little arm/ no leg | sitting, no or little arm movement, kneeling, little arm movement | coloring at table, kneeling on carpet dressing doll |
| 2. some arm/ some leg | standing, slow walking, kneeling or reaching, some arm movement | pouring water at at water table, standing & singing |
| 3. lots arm/ some leg | standing, medium walk, crawl with active arm movement, sitting with active arm movement, climbing (slow) | standing, pounding playdoh, slow climbing on jungle gym |
| 4. lots arm/ lots leg | run, hop, fast walk, kick, throw, hit, fast climb | active, fast climb on jungle gym, chasing, wrestling |

Table 3

Mean Frequency Per Motor Activity by Classroom

| Activity | Motor | Classrooms 1 | 2 | 3 |
|---|---|---|---|---|
| Art | 1 | 41.46 | 47.26 | 13.53 |
| Art | 2 | 12.93 | 42.53 | 22.13 |
| Art | 3 | .00 | 3.46 | 1.60 |
| Art | 4 | .06 | .00 | .20 |
| Blocks | 1 | 14.46 | 6.33 | 12.86 |
| Blocks | 2 | 9.60 | 6.40 | 13.40 |
| Blocks | 3 | 1.00 | 3.06 | 8.40 |
| Blocks | 4 | .00 | .00 | 1.73 |
| Discovery/Science | 1 | 2.00 | 14.93 | 13.00 |
| Discovery/Science | 2 | 5.66 | 19.60 | 5.93 |
| Discovery/Science | 3 | .00 | 1.00 | .06 |
| Discovery/Science | 4 | .00 | .00 | .06 |
| Dramatic Play | 1 | 16.26 | 14.46 | 7.86 |
| Dramatic Play | 2 | 26.60 | 30.80 | 12.06 |
| Dramatic Play | 3 | 2.60 | 7.06 | 2.60 |
| Dramatic Play | 4 | .13 | .06 | .13 |

Table 4

ANOVA Table of the Proportion of Time Spent in Motor Level 1

| Source | df number error | F | P |
|---|---|---|---|
| Sex | 1,33 | 0.329 | .570 |
| Classroom | 2,33 | 3.000 | .064 |
| Sex X Classroom | 2,33 | 0.955 | .395 |
| Structure | 2,66 | 3.425 | .038 |
| Sex X Structure | 2,66 | 0.679 | .511 |
| Classroom X Structure | 4,66 | 1,286 | .284 |
| Sex X Classroom X Structure | 4,66 | 0.128 | .972 |

REFERENCES

Block, J. Assimilation, Accomodation, and The Dynamics of Personality Development. Child Development, 1982, 53, 281-295.

Block, J. Debatable Conclusions About Sex Differences. Contemporary Psychology, 1976, 21(8), 517-522.

Buss, D.M., Block, J.H., & Block, J. Preschool Activity Level: Personality Correlates and Developmental Implications. Child Development, 1980, 51, 401-408.

Carpenter, C.J. Activity Structure and Play: Implications for Socialization. In M. B. Liss (Eds.), Social and Cognitive Skills, 1983, (pp. 117-145). New York: Academic Press.

Carpenter, C.J., (1987). Boys and Girls: Why They Behave Differently, Health & Medical Horizons, 1987, New York: MacMillan & Company.

Carpenter, C.J., Huston, A.C., Atwater, J., & Johnson, L., Early Social Experiences as Predictors of School Achievement, Paper presented at the American Psychological Association meeting, August, 1987, Washington, D.C.

Carpenter, C.J., Huston, A.C., & Holt, W. Modification of Preschool Sex-typed Behaviors by Participation in Adult-Structured Activities, Sex Roles, 1986, 14, 603-615.

Carpenter, C.J., & Huston-Stein, A. Activity Structure and Sex-Typed Behavior in Preschool Children. Child Development, 1980, 51, 862-872.

DiPietro, J.A. Rough and Tumble Play: A Function of Gender. Developmental Psychology, 1981, 17(1), 50-58.

Eaton, W., & Keats, J. Peer Presence, Stress, and Sex Differences in Motor

Activity Levels of Preschoolers. Developmental Psychology, 1982, 18(4), 534-540.

Fagot, B. The Child's Expectations of Differences in Adult Male and Female Interactions. Sex Roles, 1984, 11(7/8), 593-600.

Fagot, B. Teacher and Peer Reactions to Boys' and Girls' Play Styles. Sex Roles, 1984, 11(7/8), 691-702.

Huston, A.C., and Carpenter, C.J., Gender Differences in Preschool Classrooms: the Effects of Sex-typed Activity Choices, Chapter In (Eds) Wilkinson, L., & Cherry, R., Gender Influences in Classroom Interaction, New York: Academic Press, (1985), 143-165.

Huston, A.C., Carpenter, C.J., Atwater, J.B., and Johnson, L.M., Gender, Adult Structuring of Activities, and Social Behavior in Middle Childhood, Child Development, 1986, 57, 1200-1209.

Maccoby, E.E., & Jacklin, C.N. The Psychology of Sex Differences. 1974, Stanford, Calif.: Standford University Press.

Piaget, J. Play, Dreams, and imitation in childhood. New York: Norton, 1962.

Roper, R., & Hinde, R.A. Social Behavior in a Play Group: Consistency and Complexity. Child Development, 1978, 49, 570-579.

Waldrop, M.F. & Halverson, C. Intensive and extensive peer behavior. Child Develoment, 1975, 46, 19-26.

Youniss, J., (1980), Parents and Peers in Social Development, Chicago: University of Chicago Press.